



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

PAGE 1 of 13

REPLY TO THE ATTENTION OF:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)
UNDERGROUND INJECTION CONTROL MINOR PERMIT MODIFICATION: CLASS II

Permit Number: MI-147-2D-0006

Facility Name: Beebe #1

Pursuant to the provisions of the Safe Drinking Water Act, as amended (42 U.S.C. §300f et seq., commonly known as the SDWA) and implementing regulations promulgated by the USEPA at Parts 124, 144, 146 and 147 of Title 40 of the Code of Federal Regulations (CFR),

Mid Michigan Gas Storage Company of Houston, Texas

is hereby authorized to operate an existing injection well located in Michigan, St. Clair County, T7N, R13E, Section 16, NW 1/4 Section, for injection into the Sylvania Sandstone at depths between 2360 feet and 2464 feet, upon the express condition that the permittee meet the restrictions set forth herein.

The purpose of the injection is limited to disposal of salt water from production wells owned or operated by Mid Michigan Gas Storage Company.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective.

This permit is a minor modification of an existing permit which was signed on September 16, 1987. This permit shall become effective on NOV 8 2004 and shall remain in full force and effect during the operating life of the well, unless this permit is otherwise revoked, terminated, modified or reissued pursuant to 40 CFR 144.39, 144.40 or 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless that State chooses to adopt this permit as a State permit. This permit will be reviewed at least every five (5) years from the effective date specified above.

Signed and dated: November 8, 2004

Charles J. Elly
for

Jo Lynn Traub
Director, Water Division

This permit contains 13 pages and attachments A through C.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

230 SOUTH DEARBORN ST.

CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

Page 1 of 13

U.S. ENVIRONMENTAL PROTECTION AGENCY

UNDERGROUND INJECTION CONTROL PERMIT: CLASS II

Permit Number: MI-147-2D-0006

Facility Name: Beebe #1

Pursuant to the provisions of the Safe Drinking Water Act, as amended (42 U.S.C. §300f et seq., commonly known as SDWA) and implementing regulations promulgated by the U.S. Environmental Protection Agency (USEPA) at Parts 124, 144, 146 and 147 of Title 40 of the Code of Federal Regulations (CFR),

ANR Pipeline Company of Detroit, Michigan

is hereby authorized to operate an existing injection well located in Michigan, St. Clair County, T7N, R13E, Section 16, NW 1/4 Section, into the Sylvania Sandstone at a depth between 2360 and 2464 feet, upon the express condition that the permittee meet the restrictions set forth herein.

The purpose of the injection is for the disposal of salt water from production wells owned or operated by ANR Pipeline Company in the immediate area.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective.

This permit shall become effective on the date of issuance and shall remain in full force and effect during the operating life of the well, unless this permit is otherwise revoked, terminated, modified or reissued pursuant to 40 CFR §144.39 or §144.40. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless that State chooses to adopt this permit as a State permit. This permit will be reviewed at least every five (5) years from the date of issuance.

Signed this

16th day of Sept, 1987

Charles H. Sutfin
Charles H. Sutfin
Director, Water Division

PART I

GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit or rule, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any Primary Drinking Water Regulation pursuant to 40 CFR Part 142 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit or otherwise authorized by permit or rule is prohibited. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA), or any other law governing protection of public health or the environment, for any imminent and substantial endangerment to human health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR §144.39, §144.40, and §144.41. The filing of a request for a permit modification, revocation and reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and to the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR Part 2 and §144.5, any information submitted to USEPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, USEPA may make the information available to the

-3-

public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 CFR Part 2 (Public Information). Claims of confidentiality for the following information will be denied:

- 1) The name and address of the permittee; and
- 2) Information which deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. Duty to Comply - The permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and re-issuance or modification.
2. Penalties for Violations of Permit Conditions - Any person who operates this well in violation of permit conditions is subject to civil penalties, fines, and other enforcement action under the SWDA and may be subject to such actions under the Resource Conservation and Recovery Act. Any person who willfully violates a permit condition may be subject to criminal prosecution.
3. Need to Halt or Reduce Activity not a Defense - It shall not be a defense for a permittee in an enforcement action to state that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
4. Duty to Mitigate - The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
5. Proper Operation and Maintenance - The permittee shall at all times properly operate and maintain all facilities. Proper operation and maintenance includes effective performance and adequate funding, including appropriate quality assurance procedures.
6. Duty to Provide Information - The permittee shall furnish to the Director, within thirty (30) days, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required by this permit to be retained.

7. Inspection and Entry - The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:
- (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
 - (b) Have access to and copy, at reasonable times, any records that must be retained under the conditions of this permit;
 - (c) Inspect, at reasonable times, any facilities, equipment (including monitoring equipment), practices, or operations, regulated or required under this permit; and
 - (d) Sample or monitor the injected fluids, at reasonable times, for the purposes of assuring permit compliance, or as otherwise authorized by the SDWA, at any location.

8. Records

- (a) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, for a period of at least three (3) years from the date of the sample, measurement or report. The permittee shall also maintain records of all data required to complete this permit application and any supplemental information submitted under 40 CFR §144.27, §144.28 and §144.31. These periods may be extended by the Director at any time by written notice to the permittee.
- (b) The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment in accordance with the plugging and abandonment plan, contained in Part III(B) of this permit. At the conclusion of the retention period, if the Director so requests, the permittee shall deliver the records to the Director.
- (c) Records of monitoring information shall include:
 - (i) The date, exact place, and the time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) A precise description of both sampling methodology and the handling of samples;
 - (iv) The date(s) analyses were performed;
 - (v) The individual(s) who performed the analyses;

- (vi) The analytical techniques or methods used; and
- (vii) The results of such analyses.

9. Notification Requirements

- (a) Planned Changes - The permittee shall notify the Director at least thirty (30) days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids. An analysis of new injection fluids shall be submitted to the Director in accordance with Parts II(B)(2) and II(B)(3) of this permit.
- (b) Anticipated Noncompliance - The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- (c) Transfer of Permits - This permit is not transferrable to any person except after notice is sent to the Director and the requirements of 40 CFR §144.38 have been met. The Director may require modification or revocation of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.
- (d) Compliance Schedules - Reports of compliance or non-compliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than thirty (30) days following each schedule date.
- (e) Twenty-Four (24) Hour Reporting
 - (i) The permittee shall report to the Director any noncompliance which may endanger health or the environment. This information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall include the following information:
 - (a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
 - (b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

- (ii) A written submission shall also be provided as soon as possible but no later than five (5) days from the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
 - (f) Other Noncompliance - The permittee shall report all other instances of noncompliance. The reports shall contain the information listed in Part I(E)(9)(e)(ii) of this permit.
 - (g) Other Information - If or when the permittee becomes aware that he or she failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or corrected information.
 - (h) Report on Permit Review - Within thirty (30) days of receipt, the permittee shall report to the Director that he or she has read and is personally familiar with all terms and conditions of this permit.
10. Commencing Injection - The permittee shall not recommence injection until any remedial procedures described in Parts I(E)(16) and III(C) of this permit are complete, and;
- (i) The permittee has submitted a report on the remedial work to the Director; and
 - (ii) The Director has inspected or otherwise reviewed the remedial work and notified the permittee in writing that he or she is in compliance with the conditions of this permit; or
 - (iii) The permittee has not received, within thirteen (13) days of the date of the Director's receipt of the report required above, notice from the Director of his or her intent to inspect or otherwise review the new injection well, in which case prior inspection or review is waived and the permittee may commence injection.
11. Signatory Requirements - All reports or other information requested by the Director shall be signed and certified according to 40 CFR §144.32.

-7-

12. Notice of Plugging and Abandonment - The permittee shall notify the Director at least forty-five (45) days before conversion or abandonment of the well.
13. Plugging and Abandonment - The permittee shall plug and abandon the well as provided in the plugging and abandonment plan contained in Part III(B) of this permit. After a cessation of operation of two (2) years, the owner or operator shall plug and abandon the well in accordance with the plan provided in Part III(B) of this permit unless the operator fulfills the other requirements under 40 CFR §144.52(a)(6). The permittee shall notify the Director of plugging and abandonment in accordance with the reporting procedures in Part II(B)(3)(d) of this permit.
14. Financial Responsibility - The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection well in accordance with 40 CFR §144.52(a)(7) as provided in Attachment R of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility is acceptable. The financial responsibility mechanism shall be updated periodically, upon request of the Director.
15. Insolvency
 - (a) In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within sixty (60) days after such event.
 - (b) An owner or operator must also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within ten (10) business days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he or she is named as debtor, as required under the terms of the guarantee.

16. Remedial Action

- (a) The permittee shall shut-in the injection well whenever he/she or USEPA determines that operation thereof may be causing upward fluid migration through the wellbore of any improperly plugged or unplugged well in the area of review and shall take such steps as he/she can to properly plug the offending well(s). Any operation of the well which may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this permit. If the permittee or USEPA determines that the casing of the permitted well is leaking, the permittee will immediately shut-in the well until such time as appropriate repairs can be effected and a mechanical integrity demonstration provided to the Director.
- (b) The permittee shall not recommence injection until any and all remedial action has been taken in accordance with the plan contained in Part III(C) of this permit and the requirements in Part I(E)(10) of this permit have been met.

17. Mechanical Integrity

- (a) The permittee must establish and shall maintain mechanical integrity of this well, in accordance with 40 CFR §146.8.
- (b) A demonstration of mechanical integrity, in accordance with 40 CFR §146.8, shall be performed at least every five (5) years from the date of the last approved demonstration. The permittee shall notify the Director of his or her intent to demonstrate mechanical integrity at least thirty (30) days prior to such demonstration.
- (c) The permittee shall demonstrate the mechanical integrity of the well by pressure testing whenever: (i) the tubing is removed from the well or replaced; (ii) the packer is reset; or (iii) a loss of mechanical integrity occurs during operation.
- (d) The Director may, by written notice, require the permittee to demonstrate mechanical integrity at any time.
- (e) The permittee shall cause all gauges used in mechanical integrity demonstrations to be calibrated prior to the demonstration. For continuous annulus monitoring, gauges shall be calibrated on an annual basis.

-9-

- (f) The permittee shall cease injection if a loss of mechanical integrity during a test, or a loss of mechanical integrity, as defined by 40 CFR §146.8, becomes evident during operation. Operations shall not be resumed until the Director gives approval to recommence injection.
 - (g) The permittee shall notify the Director of the loss of mechanical integrity, in accordance with the reporting procedures in Parts II(B)(3)(d) and I(E)(9)(e) of this permit.
18. Restriction on Injected Substances - The permittee shall be restricted to the injection of oil field brines or those fluids used in the enhancement of oil and gas production, and further, no fluids other than those from sources noted in the administrative record and approved by the Director shall be injected.

PART II

WELL SPECIFIC CONDITIONS FOR UIC PERMITS

A. CONSTRUCTION REQUIREMENTS

1. Siting - Notwithstanding any other provision of this permit, the injection well shall inject only into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of the review.
2. Casing and Cementing - Injection wells shall be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. Specifics on the casing and cement to be used in the construction of the well shall be as contained in Attachments L and M of the administrative record corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein.
3. Tubing and Packer Specifications - Injection shall only take place through tubing with a packer set in the long string casing at a depth no higher than immediately above the injection zone. Tubing and packer specifications shall be as represented in engineering drawings contained in Attachments L and M of the administrative record corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein. Any proposed changes shall be submitted by the applicant for the approval of the Director before installation.
4. Wellhead Specifications - For every injection well, the operator shall provide a female fitting, with a cut-off valve, to the tubing at the wellhead, so that the amount of injection pressure being used may be measured by a representative of the USEPA by attaching a gauge having a male fitting.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. Operating Requirements(a) Injection Pressure Limitation

- (i) Beginning on the effective date of this permit, the permittee is authorized to operate the injection well, subject to the limitations and monitoring requirements set forth herein. The injection pressure and injected fluid shall be limited and monitored as specified in Part III(A) of this permit.
- (ii) Injection at a pressure which initiates fractures in the confining zone or causes the movement of injection or formation fluids into or between underground sources of drinking water is prohibited.

-11-

- (iii) Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.
- (iv) The annulus between the tubing and the long string casing shall be filled with a liquid designed to inhibit corrosion. The annulus liquid will be monitored in accordance with Parts II(B)(2)(d) and II(B)(3)(b) of this permit. Any specific annulus requirements are contained in Part III(A) of this permit.

2. Monitoring Requirements

- (a) Samples and measurements, taken for the purpose of monitoring, shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III(A) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III(A) of this permit.
- (b) Analytical Methods - Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR §136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.
- (c) Injection Fluid Analysis - The nature of the injection fluids shall be monitored as specified in Part III(A) of this permit. An initial analysis of the injection fluid is contained in Attachment H of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein.
- (d) Injection Pressure, Annulus Pressure, Annulus Liquid Loss, Flow Rate and Cumulative Volume - Injection pressure, annulus pressure, flow rate and cumulative volume shall be recorded at least weekly. Annulus liquid loss shall be recorded at least quarterly. This loss shall be reported as the volume of liquid added to the annulus to keep it filled in accordance with Part II(B)(1)(iv) of this permit. All gauges used in monitoring shall be calibrated in accordance with Part I(E)(17)(e) of this permit.

3. Reporting Requirements - Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604
Attn: UIC Branch, Direct Implementation (WU-16J)

- (a) Monthly Reports - Monitoring results obtained during each week shall be recorded on a form which has been signed and certified according to 40 CFR §144.32. Forms shall be submitted at the end of each month and shall be postmarked no later than the 10th day of the month following the sampling period. The first report shall be sent no later than the 10th day of the month following the month in which injection commences. This report shall include the weekly measurements of injection pressure, annulus pressure, flow rate and cumulative volume as required in Part III(A) of this permit.
- (b) Quarterly Reports - Monitoring results obtained each quarter shall include the measurement of annulus liquid loss as required in Part III(A) of this permit. Reports shall be submitted at the end of each quarter and shall be postmarked no later than the 10th day of the first month of the following quarter.
- (c) Annual Reports - Monitoring results obtained each year shall include the measurements of injected fluid characteristics as required in Part III(A) of this permit. Reports shall be submitted at the end of each year and shall be postmarked no later than the 10th day of the first month of the following year.
- (d) Reports on Well Tests, Workovers, and Plugging and Abandonment - The applicant shall provide the Director with the following reports and test results within sixty (60) days of completion of the activity:
 - (i) Mechanical integrity tests;
 - (ii) Logging or other test data;
 - (iii) Well workovers (using EPA Form 7520-12); and
 - (iv) Plugging and abandonment.

-13-

PART III

SPECIAL CONDITIONS

These special conditions include, but are not limited to plans for maintaining correct operating procedures, monitoring conditions and reporting, as required by 40 CFR Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

- A. OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)
- B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)
- C. REMEDIAL ACTION PLAN (ATTACHED)
- D. ADDITIONAL REQUIREMENTS (ATTACHED - if required)

OPERATING, MONITORING AND REPORTING REQUIREMENTS

<u>Characteristic</u>	<u>LIMITATION</u>	<u>MINIMUM MONITORING REQ.</u>		<u>MINIMUM REPORTING REQUIREMENTS</u>
		<u>Freq.</u>	<u>Type</u>	
*Injection Pressure	586 psig (MAXIMUM)	weekly		monthly
Annulus Pressure		weekly		monthly
Flow Rate		weekly		monthly
Cumulative Volume		weekly		monthly
Annulus Liquid Loss		quarterly		quarterly
**Chemical Composition of Injected Fluid		annually	grab	annually

SAMPLING LOCATION: at the injection pump.

*The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula:

$$(0.8 \text{ psi/ft} - (0.433 \text{ psi/ft (specific gravity)))) \times \text{depth} - 14.7 \text{ psi.}$$
 The maximum wellhead pressure is dependent upon depth and specific gravity of the injected fluid. The Sylvania Sandstone at 2360 feet was used as the depth and a specific gravity of 1.26 was used for the injected fluid.

**Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MI-147-2D-0006

Page B-1 of 2

PLUGGING AND ABANDONMENT PLAN

WELL NAME & NUMBER, FIELD NAME, LEASE NAME & NUMBER

GLENN BEEBE #1

CAPAC GAS STORAGE FIELD

MUSSEY TWP., ST. CLAIR CNTY., MI

NAME, ADDRESS, & PHONE NUMBER OF OWNER / OPERATOR

MID MICHIGAN GAS STORAGE CO. (Subsidiary of El Paso Corp.)

1001 Louisiana

Houston, TX 77002

(231) 527-3022

Locate Well and Outline Unit on
Section Plat - 640 Acres

STATE

MI

COUNTY

ST. CLAIR

STATE PERMIT NUMBER

24876

SURFACE LOCATION DESCRIPTION

1/4 of NE 1/4 of SW 1/4 of NW 1/4 of Section 16 Township 7N Range 13E

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface

Location 990 ft. From (N/S) S Line of Quarter Section

And 940 ft. From (E/W) W Line of Quarter Section

TYPE OF AUTHORIZATION

☒ Individual Permit

☐ Rule

☐ Area Permit

WELL
ACTIVITY

☐ Class I

☐ Hazardous

☐ Nonhazardous

☒ Class II

☒ Brine Disposal

☐ Hydrocarbon Storage

☐ Enhanced Recovery

☐ Class III

☐ Class IV

Number of Wells in Area Permit

1

US EPA Permit Number

MI-147-2D-0006

CASING/TUBING/CEMENT RECORD AFTER PLUGGING AND ABANDONMENT

Size	WT (lb/ft) TBG/CSC	Original Amount (CSC)	CSC to be Let in Well	Hole Size	Sacks Cement Used	Type
8-5/8"	24	333' (KB)	Cut 4' below surface	11-1/4 Est.	200 sx	CLASS A
4-1/2"	10.5	4,566' (KB)	Below Freepoint	7-7/8"	275 sx, w/Squeeze	CLASS A

**METHOD OF EMPLACEMENT
OF CEMENT PLUGS**

☒ Balance Method

☐ Dump Bailer Method

☐ Two Plug Method

☐ Other

CEMENT TO PLUG AND ABANDON DATA

	Plug #1	Plug #2	Plug #3	Plug #4	Plug #	Plug #	Plug #
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	4-1/2"	4-1/2"	4-1/2" & 7-7/8"	7-7/8" & 8-5/8"			
Calculated Top of Plug (ft.)	2068'	900'	450'	SURFACE			
Measured Top of Plug (ft.)	Tag T.O.C.	N/A	N/A	N/A			
Depth to Bottom of Plug (ft.)	2484'	2068'	900'	450'			
Sacks of Cement to be Used	30 sx	90 sx	161 sx	101 sx			
Slurry Volume to be Used (cu. Ft.)	35.4	106	190	119			
Slurry Weight (lb./gal.)	15.6	15.6	15.6	15.6			
Type of Cement, Spacer or Other Material Used	CLASS A	CLASS A	CLASS A	CLASS A			
Type of Preflush Used	BRINE	Fresh Water	Fresh Water	Fresh Water			

DESCRIPTION OF PLUGGING PROCEDURE

- 1) Set retainer @ ~2400'. Use 30 sx cement, to squeeze below retainer and into perforations. Spot extra cement on top of retainer.
- 2) POOH to 2000' and change out hole from brine to fresh water. Freepoint and jet cut (but do not pull) 4-1/2" casing.
- 3) RIH and tag/record TOC. Spot 90 Sx cement to bring TOC to 900'. (If 4-1/2" was cut near or below 900', pull casing, monitoring for NORM.)
- 4) With the end of tubing at TOC (~900'), spot 161 Sx cement to bring TOC to ~450'. (POOH and pull casing if not done previously.)
- 5) With the end of tubing at TOC (~450'), calculate and pump the volume of cement needed to bring the TOC to surface (approx. 101 Sx).
- 6) POOH and top off hole w/cement. RDMO workover rig. Cut casing 4' below grade and weld a 1/2" steel plate onto the pipe for a seal. Weld the MDEQ Permit Number onto the plate, then cover the well and clean, grade, and reseed the location.

ESTIMATED COST OF PLUGGING AND ABANDONMENT

Cement	\$ 9,050.00	Cast Iron Bridge Plug	\$ -
Logging	\$ 5,830.00	Cement Retainer	\$ 1,250.00
Rig or Pulling Unit	\$ 9,975.00	Miscellaneous	\$ 10,765.00
Freepoint & Jet Cut 4-1/2" casing	\$ 5,830.00	Total	\$ 42,700.00

CERTIFICATION

I certify under the penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE

Ronald Meredith - Supervisor, Reservoir Services

SIGNATURE

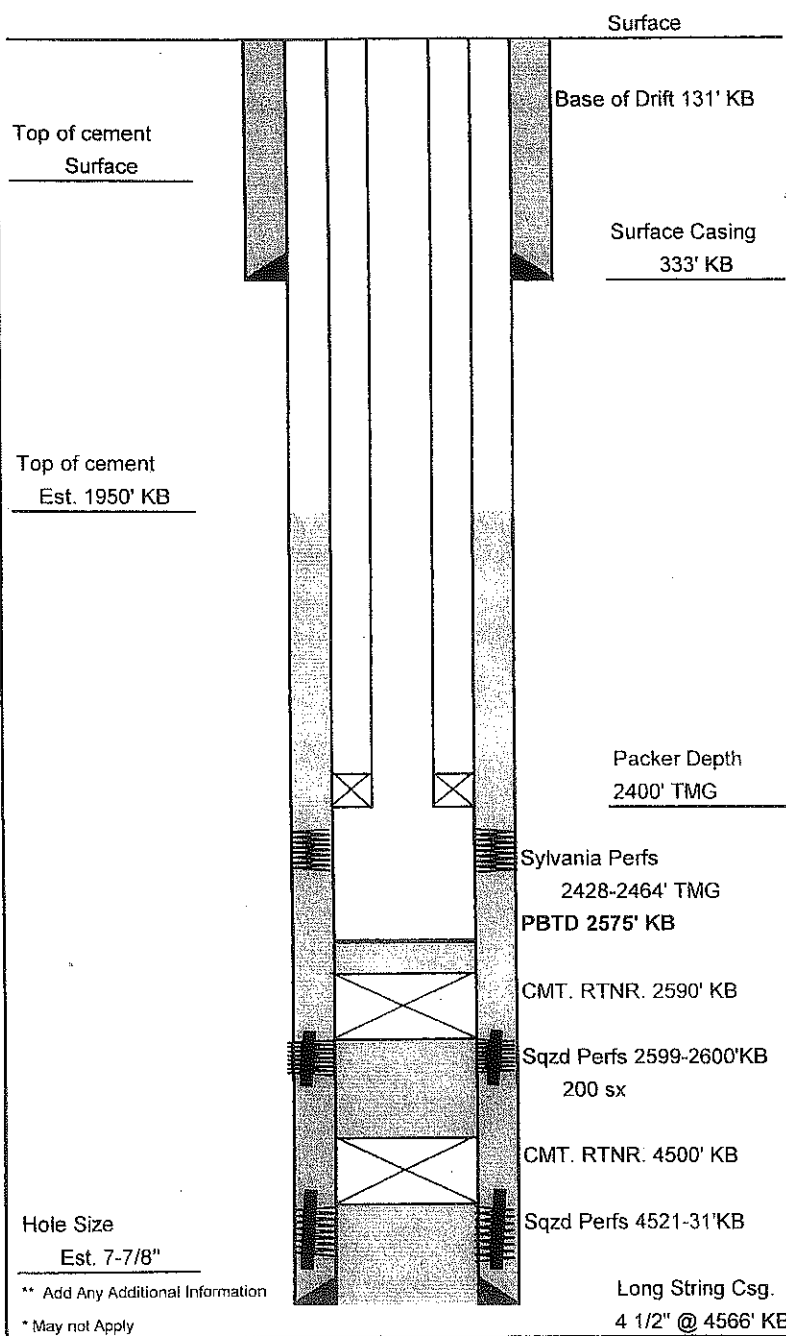
Ronald Meredith

DATE SIGNED

11/1/04

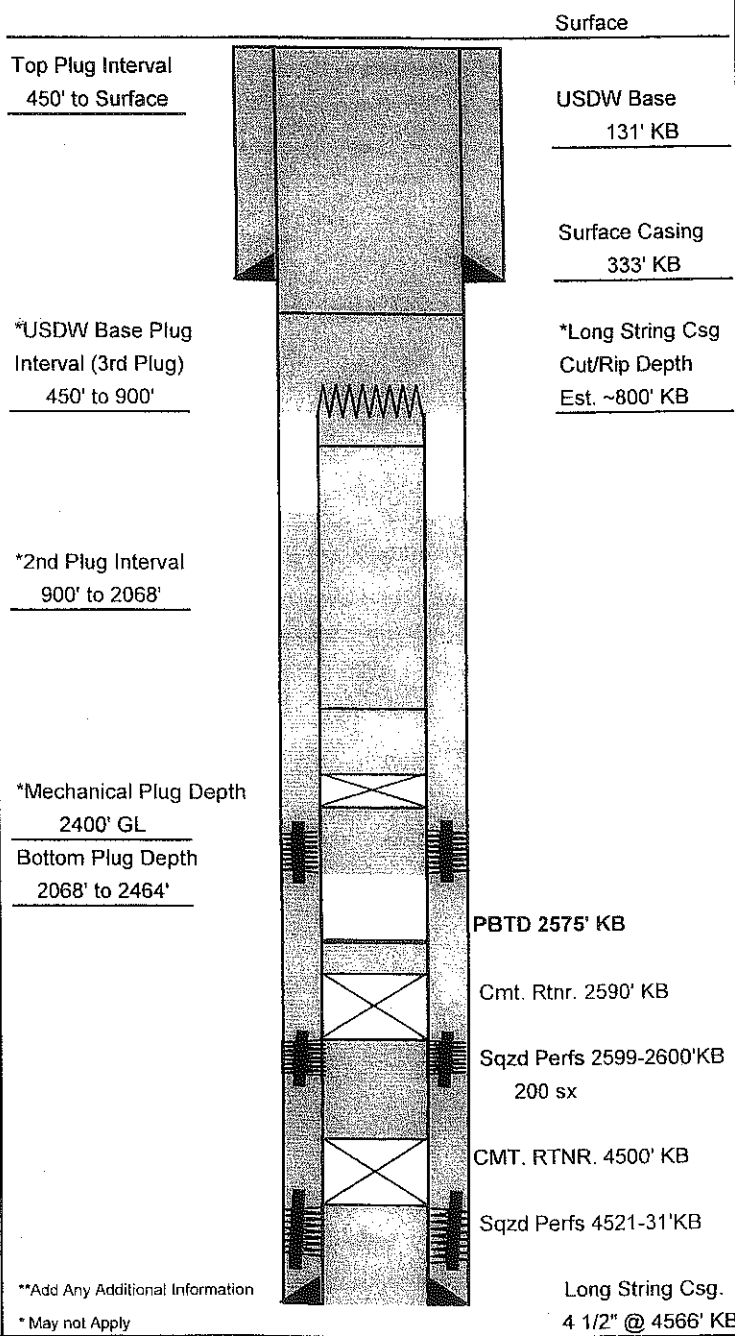
ORIGINAL WELL CONSTRUCTION DURING OPERATION
BEEBE #1 (24876)

Current Downhole Profile



PLUGGING AND ABANDONMENT CONSTRUCTION

Downhole Profile after Abandonment



LIST OF ALL OPEN AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED

Specify Open Hole/ Perforations/ Varied Casing	From	To	Formation Name
7-7/8" Est. OPEN HOLE	~800' (Estimated)	333' KB	SUNBURY SHALE

REMEDIAL ACTION PLAN

None is necessary.